

We Claim:

1. A component of a communications network capable of maintaining service interoperability during a software replacement, the component comprising:
2. a plurality of devices, each device comprising:
3. 5 a processor coupled to the communications network;
4. a memory coupled to the processor;
5. at least one first set of instructions stored in the memory and adapted to cause the processor to perform a logically de-centralized processing function;
6. at least one second set of instructions stored in the memory and adapted to cause the processor to request the performance of one of the logically de-centralized processing functions by one of the first set of instructions stored in the memory of one of the devices; and
7. 10 a third set of instructions stored in the memory and adapted to cause the processor to bind the second set of instructions requesting the performance of the logically de-centralized processing function to the one of the first set of instructions; and
8. 15 an internal network coupled to the plurality of devices and adapted to facilitate the communication of data between the devices;
9. wherein during a software replacement the first and second sets of instructions of a first subset of the devices operate under a first software version and the first and second sets of instructions of the devices not in the first subset of devices operate under a second software version;
10. 20 wherein the third set of instructions of the first subset of devices cause the processors of the first subset of devices to bind the second sets of instructions requesting logically de-centralized processing functions to first sets of instructions of the devices in the first subset of devices; and
11. 25 wherein the third set of instructions of the devices not in the first subset of devices cause the processors of the devices not in the first subset of devices to bind the second sets of instructions requesting logically de-centralized processing functions to first sets of instructions of the devices not in the first subset of devices.

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2. The component of claim 1, wherein each device further comprises at least one fourth set of instructions stored in the memory and adapted to cause the processor to perform a logically centralized processing function and the at least one second set of instructions stored in the memory further adapted to cause the processor to request the performance of one of the logically centralized processing functions by one of the fourth set of instructions stored in the memory of one of the devices, and wherein during the software replacement the third set of instructions of the devices cause the processors of the devices to bind the second sets of instructions requesting logically centralized processing functions to fourth sets of instructions of the devices.

3. The component of claim 1, wherein during the software replacement the first and second sets of instructions of a second subset of the devices operate under a third software version and the first and second sets of instructions of the devices not in the first and second subsets of devices operate under a second software version;  
wherein the third set of instructions of the second subset of devices cause the processors of the second subset of devices to bind the second sets of instructions requesting logically de-centralized processing functions to second sets of instructions of the devices in the second subset of devices; and  
wherein the third set of instructions of the devices not in the first and second subsets of devices cause the processors of the devices not in the first and second subsets of devices to bind the second sets of instructions requesting logically de-centralized processing functions to first sets of instructions of the devices not in the first and second subsets of devices.

4. The component of claim 1, further comprising a registry database for storing information relating to the first sets of instructions stored in the memories of the devices, and wherein the third set of instructions stored in the memories of the devices are adapted to cause the processor to determine the one of the first set of instructions to which to bind the second set of instructions requesting the performance of the logically de-centralized processing function based on information stored in the registry database.

5. The component of claim 1, wherein each of the devices further comprises a registry database stored in the memory, and wherein the third set of instructions stored in the memory of the device are adapted to cause the processor to determine the one of the first set of instructions to which to bind the second set of instructions requesting the performance of the logically de-centralized processing function based on information stored in the registry database.

6. A device in a component of a communications network, the component having a plurality of devices and an internal network coupled to the device and plurality of devices and adapted to facilitate the communication of data between the plurality of devices, wherein the component is adapted to maintain service interoperability during a software replacement of the devices from a first software version to a second software version during which a first subset of devices operates under the first software version and the devices not in the first subset operate under the second software version, the device comprising:
- 5 a processor coupled to the communications network;
- 10 a memory coupled to the processor;
- at least one first set of instructions stored in the memory and adapted to cause the processor to perform a logically de-centralized processing function;
- 15 at least one second set of instructions stored in the memory and adapted to cause the processor to request the performance of one of the logically de-centralized processing functions by one of the first set of instructions stored in the memory of one of the device and one of the plurality of devices of the component via the internal network; and
- 20 a third set of instructions stored in the memory and adapted to cause the processor to bind the second set of instructions requesting the performance of the logically de-centralized processing function to the one of the first set of instructions in the memory of one of the device and the one of the plurality of devices of the component via the internal network; and
- 25 wherein during the software conversion the first and second sets of instructions of the devices operate under the first software version and the third set of instructions cause the processor to bind the second set of instructions requesting the logically de-centralized processing function to first set of instructions of one of the device and one of the plurality of devices of the component operating under the first software version.

7. The device of claim 6, further comprising at least one fourth set of instructions stored in the memory and adapted to cause the processor to perform a logically centralized processing function and the at least one second set of instructions stored in the memory further adapted to cause the processor to request the performance

5 of the logically centralized processing function by one of the fourth set of instructions stored in the memory of one of the device and one of the plurality of devices of the component via the internal network, and wherein during the software replacement the third set of instructions causes the processor to bind the second sets of instructions requesting logically centralized processing functions to fourth sets of instructions of one

10 of the device and one of the plurality of devices of the component.

8. The device of claim 6, further comprising a registry database for storing information relating to the first sets of instructions stored in the memory of the device and in the plurality of devices, and wherein the third set of instructions is adapted to cause the processor to determine the one of the first set of instructions in the one of the device and one of the plurality of devices of the component to which to bind the second set of instructions requesting the performance of the logically de-centralized processing function based on information stored in the registry database.

20        9. The device of claim 6, wherein the component further includes a registry database coupled to the internal network for storing information relating to the logically de-centralized processing functions performed by the first sets of instructions stored in the memory of the device and in the plurality of devices, and wherein the third set of instructions stored in the memory of the device is adapted to cause the processor to  
25 retrieve information relating to the logically de-centralized processing function requested by the one of the first set of instructions from registry database, and to determine the one of the first set of instructions of the one of the device and one of the plurality of devices to which to bind the second set of instructions based on information retrieved from the registry database.

10. A method of maintaining service interoperability during a software replacement in a communications network component having a plurality of devices operating with a current release of software and implementing a clustered architecture, each device being programmed with one or more applications and one or more logically de-centralized services accessed by the applications, the method comprising:

5       installing a new release of software on a first subset of the devices;  
      configuring the devices of the first subset of the devices so that applications of the first subset of devices are bound to logically de-centralized processing functions on the first subset of devices upon requesting logically de-centralized processing functions;

10 and

      configuring the devices not in the first subset of the devices so that applications on devices not in the first subset of devices are bound to logically de-centralized processing functions on devices not in the first subset of devices upon requesting logically de-centralized processing functions.

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11. The method of claim 10, further comprising repeating the installing and configuring steps until the new release of software is installed on all the devices.

20 12. The method of claim 10, wherein the installing step comprises installing the new release of software on one-half of the devices.

13. The method of claim 10, wherein the installing step comprises installing the new release of software on one of the devices.

14. The method of claim 10, wherein each device has a name service being adapted to bind an application to a logically de-centralized processing function upon receiving a request from the application for the logically de-centralized processing function, the configuration of the first subset of devices comprising configuring the 5 name service of each device in the first subset of devices so that applications of the first subset of devices are bound to logically de-centralized processing functions on the first subset of devices upon requesting logically de-centralized processing functions, and the configuration of the devices not in the first subset of the devices step comprising configuring the name service of each device not in the first subset of devices so that 10 applications on devices not in the first subset of devices are bound to logically de-centralized processing functions on devices not in the first subset of devices upon requesting logically de-centralized processing functions.

15. The method of claim 10, wherein each of the devices includes one or 15 more logically centralized processing functions accessed by the applications, the method further comprising the step of configuring the devices so that a application on one of the devices is bound to a logically centralized processing functions on one of the devices upon requesting logically centralized processing functions.

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16. A method of maintaining service interoperability during a software replacement in a component of a communications network having a plurality of devices connected by an internal network, each device having at least one application and at least one local service being configured to perform at least one logically de-centralized processing function and wherein an application requests performance of a logically de-centralized processing function performed by one of the local services of one of the devices of the component, and wherein during the software replacement a first subset of devices operates under the first software version and the devices not in the first subset operate under the second software version, the method comprising:
- 5        requesting the performance a logically de-centralized processing function, the request being issued by an application of one of the first subset of devices;
- 10      determining which local service of the first subset of devices performs the logically de-centralized processing function requested by the application;
- 15      binding the application requesting the logically de-centralized data function to the local service of the device of the first subset of devices providing the logically de-centralized processing function; and .
- performing the requested logically de-centralized processing function at the local service of the device of the first subset of devices.

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17. The method of claim 16, further comprising:
- requesting the performance a logically de-centralized processing function, the request being issued by an application of a device not in the first subset of devices;
  - determining which local service of the devices not in the first subset of devices
  - 5 performs the logically de-centralized processing function requested by the application;
  - and
  - binding the application requesting the logically de-centralized data function to the local service of the device not in the first subset of devices providing the logically de-centralized processing function; and
- 10 performing the requested logically de-centralized processing function at the local service of the device not in the first subset of devices.
18. The method of claim 16, wherein each device further includes at least one global service being configured to perform at least one logically centralized processing function and wherein an application requests performance of a logically centralized processing function performed by one of the global services of one of the devices of the component, the method further comprising:
- requesting the performance a logically centralized processing function, the request being issued by one of the applications;
  - 20 determining which global service performs the logically centralized processing function requested by the application; and
  - binding the application requesting the logically centralized data function to the global service of the device providing the logically centralized processing function; and
  - 25 performing the requested logically centralized processing function at the global service of the device.

19. The method of claim 16, wherein the component further includes a registry database for storing information relating to the logically de-centralized processing functions performed by the local services of the devices, the method further comprising:

5 retrieving information from the registry database relating to the logically de-centralized processing function requested by the application of the one of the first subset of devices; and

determining which local service of the first subset of devices performs the logically de-centralized processing function requested by the application based on the 10 information from the registry database.

20. The method of claim 16, wherein each of the devices further includes a registry database for storing information relating to the logically de-centralized processing functions performed by the local services of the devices, the method further comprising:

retrieving information from the registry database of the one of the first subset of devices relating to the logically de-centralized processing function requested by the application of the one of the first subset of devices; and

determining which local service of the first subset of devices performs the logically de-centralized processing function requested by the application based on the 20 information from the registry database of the one of the first subset of devices.

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21. The method of claim 16, wherein each device has a name service being adapted to bind an application to a local service for performance of a requested logically de-centralized processing function upon receiving a request from the application for the logically de-centralized processing function, the method further comprising:

- 5 receiving the request being issued by the application of one of the first subset of devices at the name service of the one of the first subset of devices;
- determining at the name service of the one of the first subset of devices which local service of the first subset of devices performs the logically de-centralized processing function requested by the application; and
- 10 binding by the name service of the application requesting the logically de-centralized data function to the local service of the device of the first subset of devices providing the logically de-centralized processing function.